Field Day in Paradise

Dawn breaks on the K6H Field Day site near Honokaa on the Big Island of Hawaii

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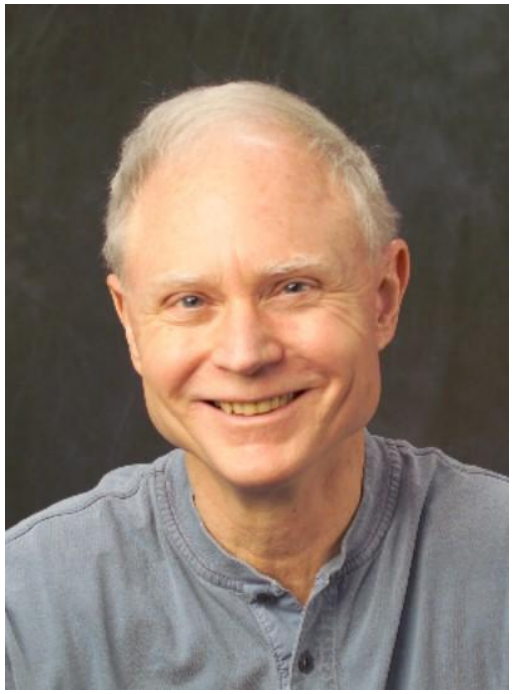
www.deloach.net/Hawaii.htm

Why Field Day in Hawaii?

- XYL Maggie, KK6DZS, and I have been doing Field Days from across North America on our road trips for years
- When the kids wanted to hold our 2025 family reunion in Hawaii in June, we immediately realized Field Day needed to be part of the plan!
- We reached out to two longtime friends to join our Field Day adventure and they were all in!
  - Ace CW operator Andreas Wachter, K6AKW
  - Field Day veteran & WVARA alumnus Jon Griffiths, W6PI

Finding the Perfect Hawaiian Site

- We knew we needed to be on the northeast side of one of the islands so we could point a big antenna towards North America, but which island?
- With some research on Google Earth, we quickly realized that the Big Island had the best northeast access, so we focused there
- Andreas, being fearless, just started reaching out to local clubs and everyone he knew with any connection to the Big Island
- His queries eventually found Ceri, AH6CS, who put us in contact with Denning, WH6GDC
- Denning has a large property looking exactly the right direction, with plenty of space for antennas, and he graciously offered up his yard for this adventure



Denning Powell, WH6GDC

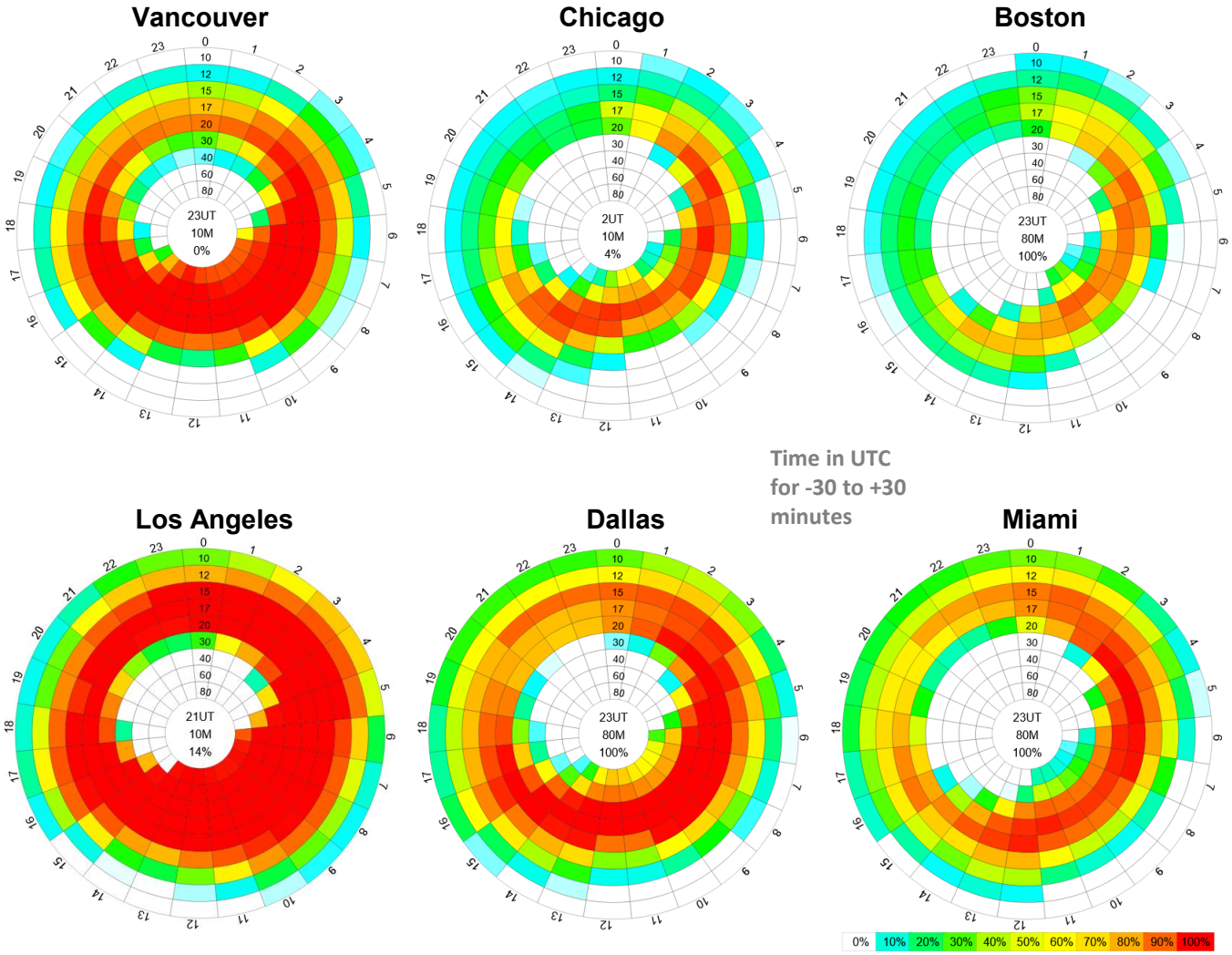
Planning Our Field Day

Best Bands to Work North America?

Used the excellent VOACAP web site to predict the most promising bands

Key Takeaways:

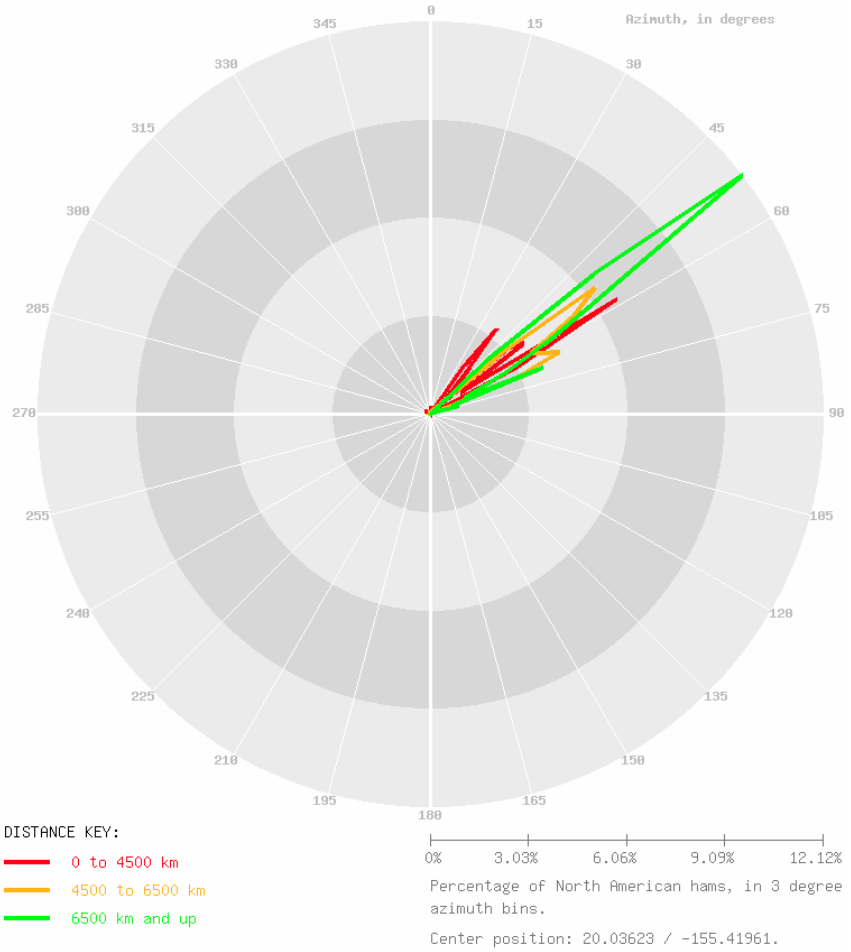
- 20-meters seemed like the money band – solid both night and day
- 15-meters looked like a strong daytime play as well
- 10-meters seemed iffy, but there is always hope!
- 40-meters seemed like a reasonable nighttime play
- 80-meters looked solid only to the West Coast and only in the wee hours



Modeled parameters: CW, 100W, 28 June 2025. TX antennas: 3-el Yagi at 15m for 20, 15, & 10m, dipole at 15m for 40m, dipole at 5m for 80m. RX antennas: Dipole at 15m all bands

Best Antenna Orientation to Work North America?

- We used this web site to see a distribution of the U.S. & Canadian ham population broken out by azimuth & distance from Denning's QTH
- US & Canadian hams line up tightly between about 40 and 70 degrees
- Distances are between ~3,900 and ~8,000 km, so low takeoff angle essential
- Thus, what was desired was as much gain as possible pointed straight at 55 degrees with a tight +/-15-degree beam width and as low a takeoff angle as possible



Distribution of North American Hams from the K6H Field Day location. Source: www.deloach.net/PointYourFieldDayAntenna/

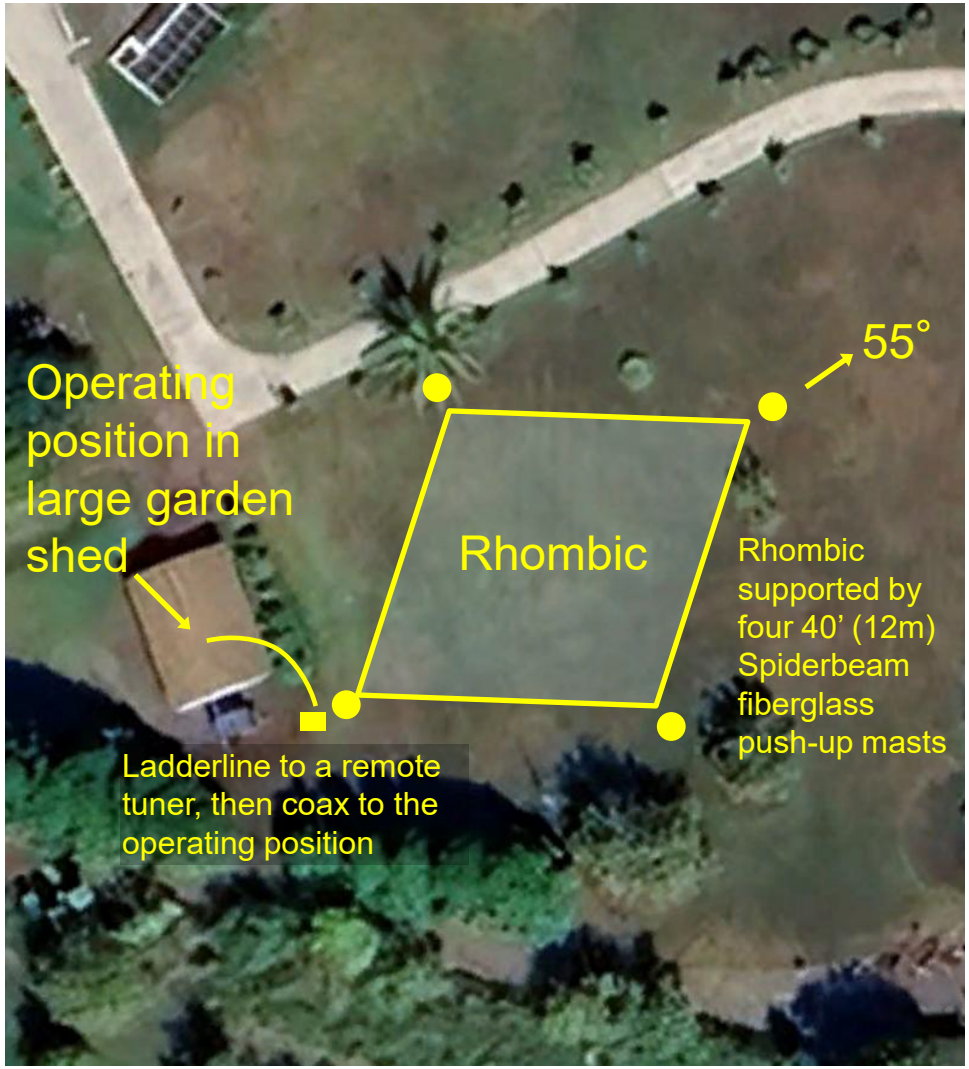
Antenna Requirements by Band and Time

	Daytime	Nighttime
To North America	• For 20, 15, and hopefully 10-meters, desired was a tight beam on 55-degrees ± 15-degrees with low takeoff angle	• Ditto for 20-meters • For 40-meters, as much horizontal gain towards the northeast as possible with as low a takeoff angle as possible • For 80-meters, as low a low takeoff angle as possible

Within Hawaii	• Local Hawaiian Field Day activity focuses on 40-meters
	  • Meet-ups scheduled for Hawaiian stations to work each other and chat
	  • 40-meters also useful for Winlink message handling
	• NVIS high takeoff angle optimal
		• Our research showed there really wasn't much 80-meter activity planned within Hawaii

Squeezing As Much Antenna on to Denning's Land As Possible

- Andreas, then Maggie and I, did survey visits to assess antenna possibilities, among other things
- No trees ended up being high enough with enough accessible open space to support useful antennas, but Denning had the perfect open field – gently sloping downward to the northeast
  - The downward slow is key to a low takeoff angle
- Jon, W6PI, modeled several large high-performance wire antennas to fill this space, including a delta loop beam and a V beam, but we decided on a 'small' rhombic known as the 'Rhombic Loop Twofer'
- There were no other ideal locations for antennas



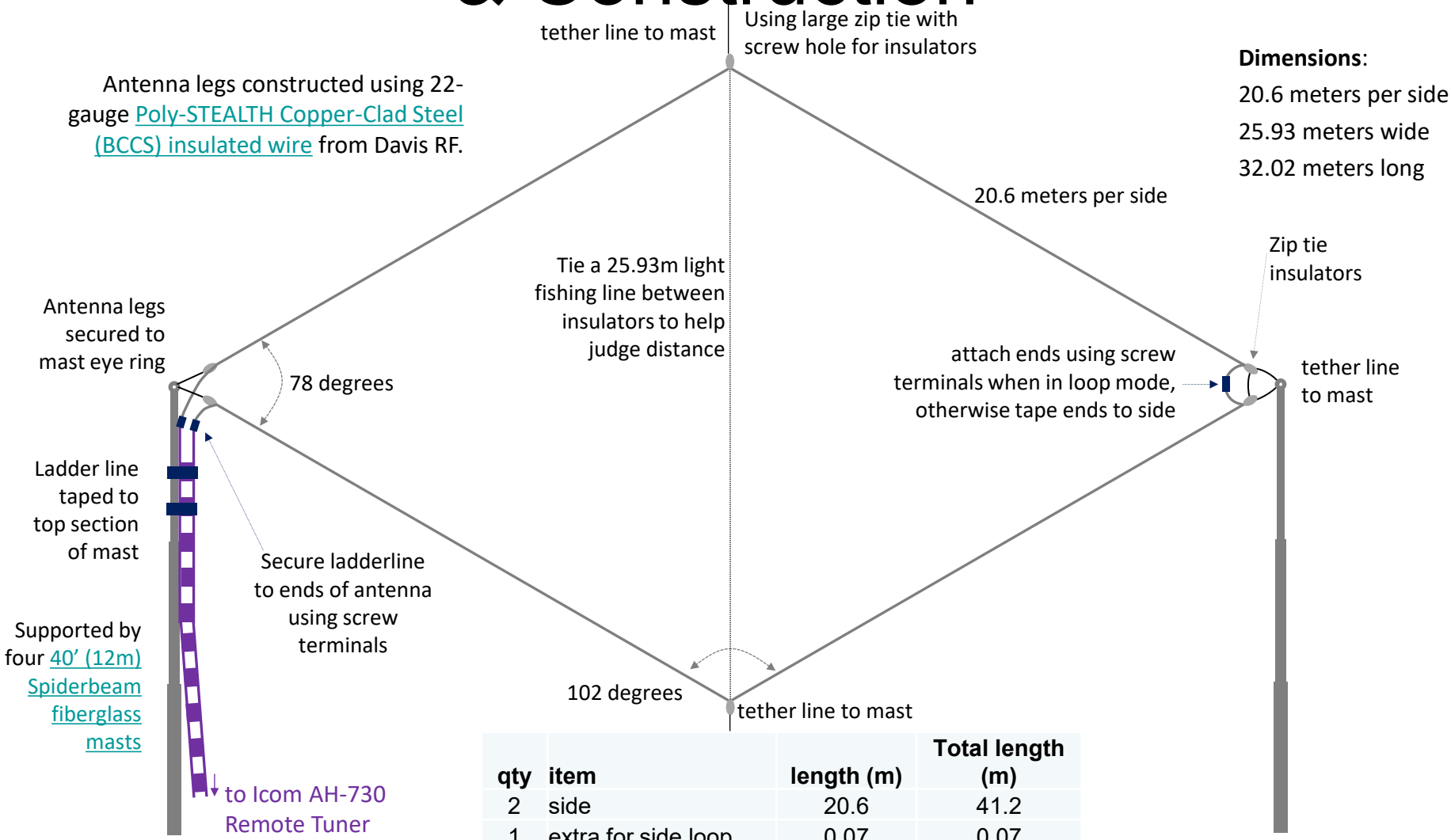
What is the “Rhombic Loop Twofer”?

- The Rhombic Loop Twofer is two antennas in one – a small but potent rhombic[1] by day, and a Loop Skywave[2] by night
- The ‘mode’ of operation is controlled by connecting or disconnecting the wires at the apex of the antenna:
  - When the wires at the apex are disconnected, it’s a ‘small’ rhombic – a high gain, bidirectional, naturally broad-banded, dimensionally un-fussy antenna on 20 meters and up
  - When the wires at the apex are connected, it’s a ‘Loop Skywave’ – a horizontal full wavelength loop with near-vertical incidence skywave (NVIS) properties on 80 meters, and some gain on 40 meters
- Usable on all HF bands, though tuning required
- More info on this antenna at my Rhombic Loop Twofer page
- I’ve used variants of this antenna several times to good effect

[1] The ARRL Antenna Book provides a good discussion of the theory behind rhombics and other ‘traveling wave’ antennas.

[2] See J. Hallas, W1ZR, “Another Look at the Full-Wave HF Loop Antenna,” QST, May 2016, pp 42-45, for a good description of loop antennas and the Loop Skywave.

Rhombic Loop Twofer Dimensions & Construction



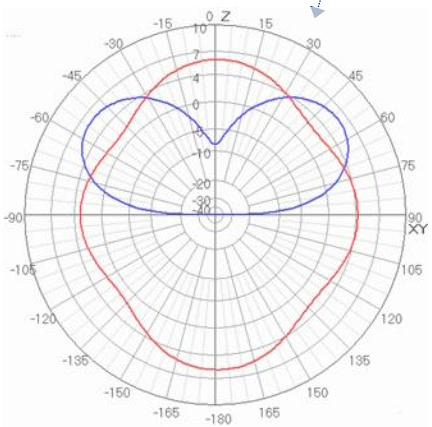
qty	item	length (m)	Total length (m)
2	side	20.6	41.2
1	extra for side loop	0.07	0.07
2	extra for end loops	0.07	0.14
2	extra for end pigtails	0.15	0.3
Total Cut Length for One Leg of the Rhombic Loop Twofer (m)			**41.71**

Rhombic Loop Twofer NEC Models

- John, W6PI, modeled this antenna in NEC and confirmed:
  - Very high gain on 20, 15, and 10-meters, with low takeoff angle
  - A nice NVIS pattern on 40-meters for Hawaiian contacts
  - OK, not great, 40-meter gain and takeoff angle in Loop Mode
- This antenna met most of our needs, so we decided to go with it alone with a '1A' station

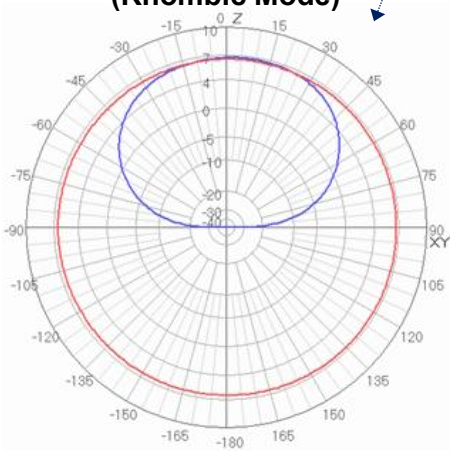
Quad-directional pattern & moderate takeoff angle

40-meters (Loop Mode)



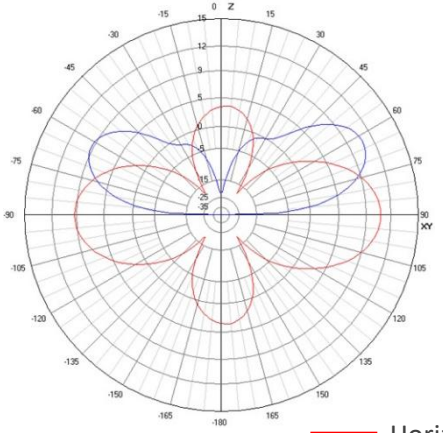
A well-performing NVIS pattern present on 40m, perfect for local Hawaiian contacts & passing Winlink traffic

40-meters (Rhombic Mode)



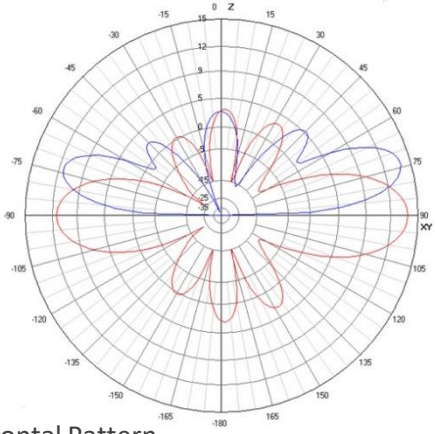
20m performance easily better than a 3-el Yagi, with strong horizontal gain and low takeoff angle

20-meters (Rhombic Mode)

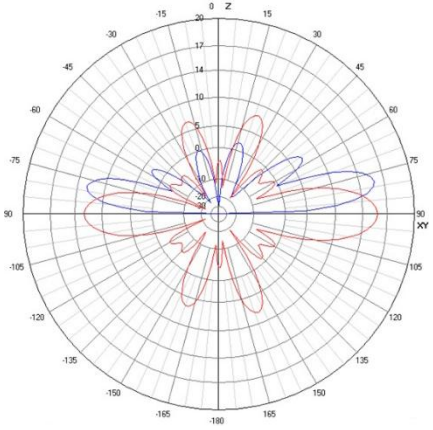


15m & 10m gain even stronger; takeoff angle lowers further and starts to fragment

15-meters (Rhombic Mode)



10-meters (Rhombic Mode)

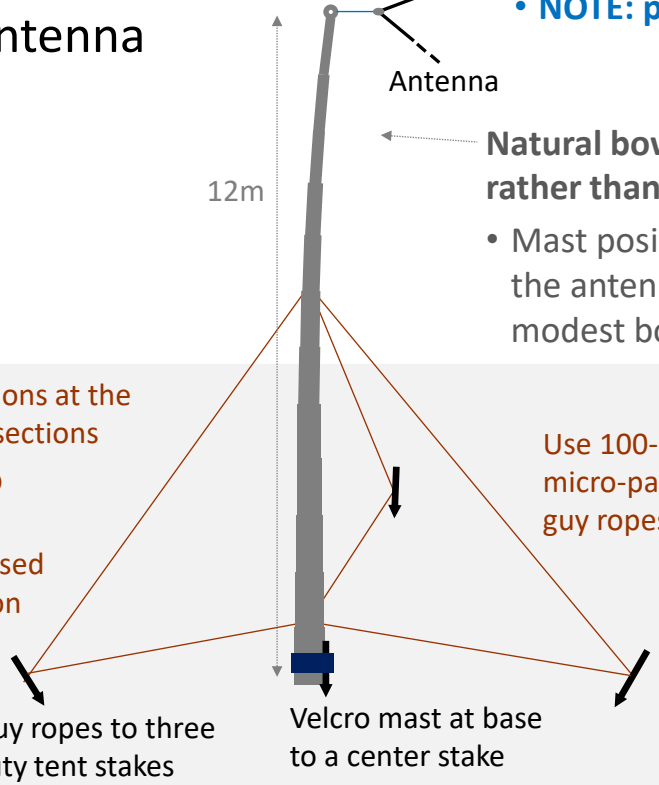


Horizontal Pattern

Vertical Pattern

Fiberglass Mast Support Method

Four 12m (40') Spiderbeam fiberglass push-up masts used to hold up antenna



Short (~1m) micro-paracord rope & 100-lb fishing snap swivel connects antenna to mast eyelet

- **NOTE: pull rope from ground *NOT* used**

Natural bowing of mast used to tension antenna, rather than downward force from a pull rope

- Mast positioned 1 or 2 meters back from where the antenna corner is desired to be, causing modest bowing which keeps the antenna taunt

Guyed in three directions at the top of the 1st and 7th sections

- Clamp used for top of 1st section
- Slip-on cloth ring used for top of 7th section

Use 100-lb 1.12mm micro-paracord for guy ropes

guy rope lengths:

- Lower: 8m
- Upper: 11m

Secure guy ropes to three heavy-duty tent stakes

Velcro mast at base to a center stake

Rope tensioners used to tighten guy ropes

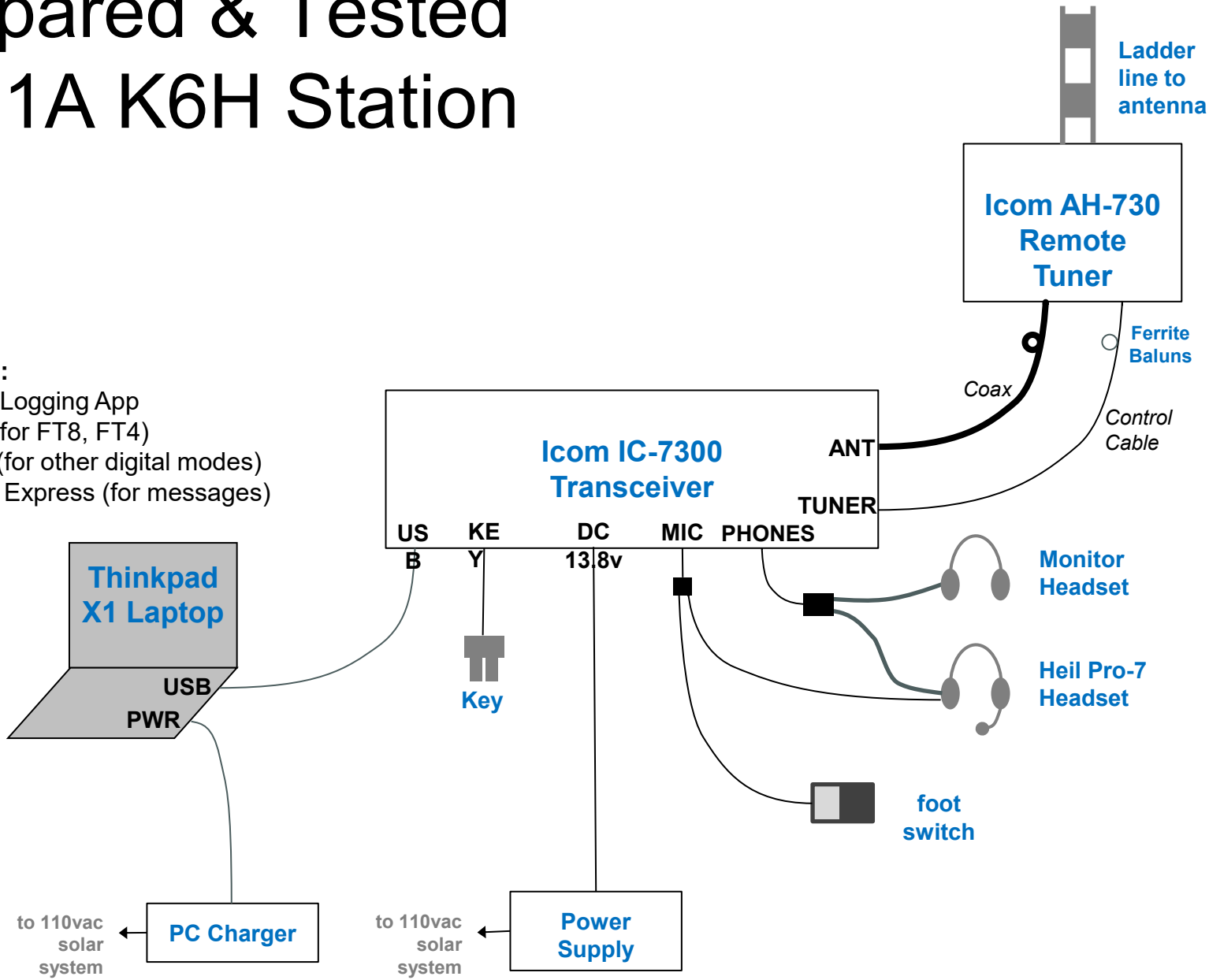
NOTE: Masts can be lowered in high winds

Logistical Preparations

- Requested 1x1 call sign “K6H”
- We researched how previous Hawaiian Field Day group were configured
  - Decided to go with 100 Watts rather than QRP
- Prepared training & promotional materials
- Denning reached out to local media, politicians, public service agencies, and local emergency preparedness groups

Prepared & Tested the 1A K6H Station

PC Apps:
- N3FJP Logging App
- WSJT (for FT8, FT4)
- FLDigi (for other digital modes)
- Winlink Express (for messages)



Getting the Equipment to Hawaii

- All critical equipment flown in
- Hand caried the rig & tuner on the plane
- All remaining station equipment, antenna, masts, mast guying, and essential tools flew with us as checked baggage
- Denning had backup tools, a backup rig in case of primary equipment failure, and critically a complete solar system
- Amazon heavy duty tent stakes shipped directly to Hawaii

Convenient direct flight from SJC to KOA

Last Minute Personnel Change

- Sadly, both Andreas and Jon had to pull out at the last minute due to a family member medical issue and a death in the family
- I had hoped I would be able to get the station set up – then just hang out and greet guests while sipping a Mai Tai – but this was not to be…

Hawaii

Arrival

- We flew into Kona, rented a car, and immediately drove to Honokaa on the northeast side of the island to drop the gear at Denning's shed
- The next day, antenna setup would begin

Arrival at Denning's QTH. The complete station fit easily in the back of our rental car.

Antenna Setup

- It took us a while to figure out that pull ropes don’t work with Spiderbeam fiberglass masts, but once we did, we had the rhombic up by midday Friday
- The station was running and tested by Friday night, and we were ready to start bright and early Saturday morning

Denning, WH6GDC *and Maggie, KK6DZS setting up the masts*

Denning, WH6GDC *routing the ladder-line*

Guests!

- Denning did a great job getting the word out
- Guests started showing up first thing Saturday and continued to arrive all day – over 30 in total
- Many were from the Big Island's Community Emergency Response Team (CERT) community – quite a few with Technician licenses
- LOTS of interest in HF for emergency preparedness but little experience
- We spent much of Saturday demonstrating HF and getting folks on the air

Weather

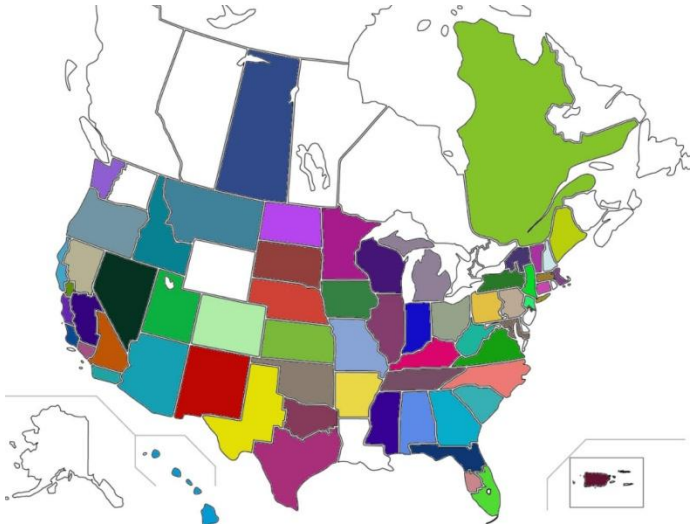
- Storms came through a couple times, but the antenna and equipment survived!

How Did We Get Out on HF?

- Could work anyone we heard
- 15m was the money band – open and solid all day long on all modes
- Didn't even bother to switch to 20m until after dinner Saturday night
- Since I hadn't exhausted 20m, never bothered to try 40m to the mainland
  - Did use 40m for an SSB scheduled Hawaiian meet-up and to pass Winlink traffic
- 10m opened up for a few hours in the afternoon for digital & CW, though at a time when I was busy with guests

QSO Counts

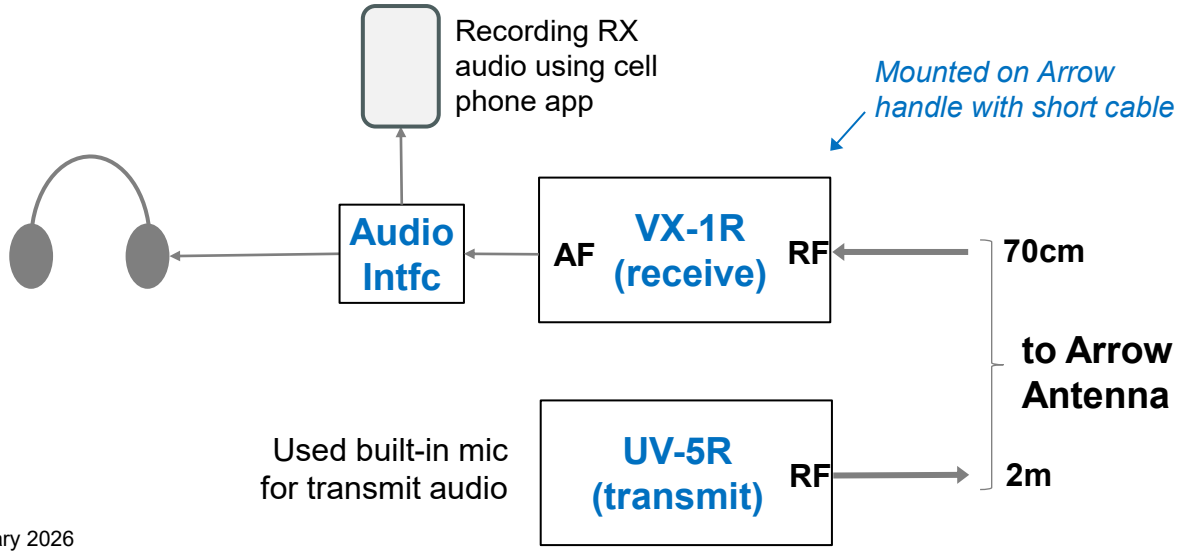
Band	CW	Phone	Dig	Total	%
40m	0	4	0	4	2%
20m	41	0	14	55	21%
15m	41	73	71	185	72%
10m	1	0	11	12	5%
Total	83	77	96	256	100%

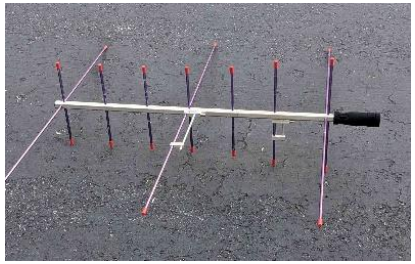


Worked 47 ARRL/RAC Sections

Satellite Operation

- I came prepared with a simple FM satellite station, but the pass gods did not favor me
  - The few FM passes were way off to the southeast away from Hawaiian population centers
- I could hear myself, but no one to work ☹





Bonus Points

- Most of the bonus points we planned to get we did get

	Points	Activity	Notes
√	100	100% Emergency Power	Denning's awesome solar system!
√	100	Public Information Table	Brought and distributed promotional material.
√	100	Section Manager Message	Transmitted message using HF Winlink.
√	100	Message Handling	Transmitted 10 messages using HF Winlink.
X	100	Satellite QSO	Brought a simple station but no one to work. ☹
√	100	Alternate Power	Denning's awesome solar system!
√	100	Copy ARRL Bulletin	K6KPH bulletin from CA easily copied.
√	100	Educational Activity	Denning hosted a presentation on CERT activities on the Big Island.
√	100	Social Media	Maggie posted on Facebook.
√	100	Safety Officer	Maggie served as Safety Officer, as always.
√	100	Youth Participation	Lots of kids showed up and we made over 10 QSOs!
√	100	Media Publicity	Denning's press release published in local politician's newsletter – several folks showed up because of this.
X	100	Elected Official Visit	Though invited, nobody showed up.
X	100	Agency Visit	Though invited, nobody showed up.
√	50	Web Submission	Submitted online.

Lessons Learned

We had 2,120 points overall, coming in 4th in Hawaii after several larger operations – not bad – but what could we have done better?

- A 2A or 1A+GOTA setup would have been ideal – with one hardcore contest station and one demonstration station
  - A serious contester teammate could blast away with a high-performance antenna while I received guests at a demonstration station, tended to bonus points, and the like
- Having a high-performance antenna really paid off
  - I could work anyone I heard – usually on the first try
  - From talking with other Hawaiian hams on the 40m meet-up, it was clear the rhombic was getting out better and more bands were accessible
- Given how well the antenna was performing, QRP probably could have been viable – at least for CW and digital
- Digital was working well – particularly FT4, which is quicker and nimbler
- It sure would have been fun to try 80-meters from Hawaii to the mainland, but I lacked a low takeoff angle antenna
- If I had had access to the linear birds I probably could have made the satellite QSO

Questions

Thank You!

www.deloach.net/Hawaii.htm